What is Claimed Is:

1. A method for converting output data from a computer tomography (CT) device to linear attenuation coefficient data, comprising the steps of:

receiving output pixel data from a CT device for a pixel of a CT image;

comparing a value of the pixel data to a predetermined range;

if said value is within said predetermined range, calculating a linear attenuation coefficient from said pixel data using a first function;

if said value is outside said predetermined range, calculating said linear attenuation coefficient from said pixel data using a second function; and

storing said calculated coefficient in a memory as part of a linear attenuation coefficient map.

2. The method recited in claim 1, wherein said first function is a function independent of a transmission energy related to said pixel data and said second function is a function of said transmission energy.

3. The method recited in claim 1, wherein said first function includes an air-water approximation and said second function includes a water-bone approximation.

4. The method recited in claim 1, further comprising a step of estimating an effective transmission energy associated with said pixel data.

5. The method recited in claim 4, wherein said first function is a function independent of said effective transmission energy and said second function is a function of said effective transmission energy.

6. The method recited in claim 1, further comprising a step of converting said pixel data to Hounsfield units prior to said comparing step.

7. The method recited in claim 1, wherein said predetermined range comprises a range of Hounsfield units for water to Hounsfield units for air.

8. The method recited in claim 4, further comprising the steps of:
generating a histogram for said CT image;
determining a dominant bone peak from said histogram; and
wherein said dominant bone peak is used for estimating said effective transmission energy.

9. The method recited in claim 8, wherein said first function is a function independent of said effective transmission energy and said second function is a function of said effective transmission energy and a value of said dominant bone peak.

10. The method recited in claim 8, wherein said first function varies based upon a relationship between an emission energy related to said pixel and a transition energy.

11. The method recited in claim 8, wherein, if no dominant bone peak is determined, the following additional steps are performed:
calculating a Laplacian of said histogram;
determining a local maximum from said Laplacian;
setting said effective transmission energy based on said local maximum; and
setting said dominant bone peak based on said local maximum.

12. A method for converting output from a computer tomography (CT) device to a linear attenuation coefficient map, comprising the steps of:
receiving output pixel data from a CT device for each pixel of a CT image and for each pixel:
comparing a value of the pixel data to a predetermined range;
if said value is within said predetermined range, generating a first function and calculating a linear attenuation coefficient from said pixel data using said first function; and

if said value is outside said predetermined range, generating a second function and calculating a linear attenuation coefficient from said pixel data using said second function; and

generating a linear attenuation coefficient map based upon each linear attenuation coefficient calculated for each pixel.

13. The method recited in claim 12, wherein said first function is a function independent of a transmission energy related to said pixel data and said second function is a function of said transmission energy.

14. The method recited in claim 12, wherein said first function includes an air-water approximation and said second function includes a water-bone approximation.

15. The method recited in claim 12, further comprising a step of estimating an effective transmission energy associated with said pixel data.

16. The method recited in claim 15, wherein said first function is a function independent of said effective transmission energy and said second function is a function of said effective transmission energy.

17. The method recited in claim 1, further comprising a step of converting said pixel data to Hounsfield units prior to said comparing step.

18. The method recited in claim 12, wherein said predetermined range comprises a range of Hounsfield units for water to Hounsfield units for air.

19. The method recited in claim 15, further comprising the steps of:

generating a histogram for said CT image;

determining a dominant bone peak from said histogram; and

wherein said dominant bone peak is used for estimating said effective transmission energy.

20. The method recited in claim 19, wherein said first function is a function independent of said effective transmission energy and said second function is a function of said effective transmission energy and a value of said dominant bone peak.

21. The method recited in claim 19, wherein said first function varies based upon a relationship between an emission energy related to said pixel and a transition energy.

22. The method recited in claim 19, wherein, if no dominant bone peak is determined, the following additional steps are performed:

calculating a Laplacian of said histogram;

determining a local maximum from said Laplacian;

setting said effective transmission energy based on said local maximum; and

setting said dominant bone peak based on said local maximum.

23. A system for generating a linear attenuation coefficient map, comprising:

an input for receiving pixel data;

a processing unit configured to compare a value of the pixel data to a predetermined range, to select a function based on whether said value is within said predetermined range or outside said predetermined range, and to calculate a linear attenuation coefficient from said pixel data using the selected function; and

an output for outputting said calculated linear attenuation coefficient.

24. The system as recited in claim 23, further comprising:

a storage unit coupled with said processing unit and configured to store conversion data.

25. The system as recited in claim 23, wherein said processing unit is further configured to calculate a transmission energy of said pixel data, and wherein

if said value is within said predetermined range, said processing unit generates a function that is independent of said transmission energy related to said pixel data, and if said value is outside said predetermined range, said processing unit generates a function that is dependent upon said transmission energy.

26. The system recited in claim 23, wherein if said value is within said predetermined range, said processing unit generates a function that includes an air-water approximation, and if said value is outside said predetermined range, said processing unit generates a function that includes a water-bone approximation.

27. The system as recited in claim 23, wherein said processing unit is further configured to estimate an effective transmission energy associated with said pixel data.

28. The system as recited in claim 27, wherein said processing unit converts said pixel data to Hounsfield units.

29. The system as recited in claim 27, wherein said predetermined range comprises a range of a Hounsfield units value for water to a Hounsfield units value for air.

30. The system as recited in claim 27, wherein said processing unit is further configured to generate a histogram for said CT image, determine a dominant bone peak from said histogram, and use said dominant bone peak for estimating said effective transmission energy.

31. The system as recited in claim 30, wherein if said value is outside said predetermined range, said processing unit generates a function based on said effective transmission energy and a value of said dominant bone peak.

32. The system as recited in claim 30, wherein if said value is inside said predetermined range, said processing unit generates a function based upon a relationship between an emission energy related to said pixel and a transition energy.

33. A computer program product, residing on a computer readable medium, for interactively constructing, editing, rendering and manipulating pixel data for a CT image, said computer program comprising computer executable instructions for causing the computer to perform the following:

receiving output pixel data from a CT device for a pixel of a CT image;

comparing a value of the pixel data to a predetermined range;

if said value is within said predetermined range, calculating a linear attenuation coefficient from said pixel data using a first function;

if said value is outside said predetermined range, calculating said linear attenuation coefficient from said pixel data using a second function; and

storing said calculated coefficient in a memory as part of a linear attenuation coefficient map.

34. The computer program product recited in claim 33, wherein in the computer executable instructions, said first function is a function independent of a transmission energy related to said pixel data and said second function is a function of said transmission energy.

35. The computer program product recited in claim 33, wherein in the computer executable instructions, said first function includes an air-water approximation and said second function includes a water-bone approximation.

36. The computer program product recited in claim 33, wherein said computer executable instructions causing the computer to further perform a

step of estimating an effective transmission energy associated with said pixel data.

37. The computer program product recited in claim 36, wherein in the computer executable instructions, said first function is a function independent of said effective transmission energy and said second function is a function of said effective transmission energy.

38. The computer program product recited in claim 33, wherein said computer executable instructions causing the computer to further perform a step of converting said pixel data to Hounsfield units prior to said comparing step.

39. The computer program product recited in claim 33, wherein in the computer executable instructions, said predetermined range comprises a range of Hounsfield units for water to hounsfield units for air.

40. The computer program product recited in claim 36, wherein said computer executable instructions causing the computer to further perform the steps of:

generating a histogram for said CT image;

determining a dominant bone peak from said histogram; and

wherein said dominant bone peak is used for estimating said effective transmission energy.

41. The computer program product recited in claim 40, wherein in the computer executable instructions, said first function is a function independent of said effective transmission energy and said second function is a function of said effective transmission energy and a value of said dominant bone peak.

42. The computer program product recited in claim 40, wherein in the computer executable instructions, said first function varies based upon a

relationship between an emission energy related to said pixel and a transition energy.

43. The computer program product recited in claim 40, wherein in the computer executable instructions, if no dominant bone peak is determined, said computer executable instructions causing the computer to further perform the steps of:

calculating a Laplacian of said histogram;

determining a local maximum from said Laplacian;

setting said effective transmission energy based on said local maximum; and

setting said dominant bone peak based on said local maximum.

44. A system for generating a linear attenuation coefficient map, comprising:

input means for receiving pixel data;

processing means for comparing a value of the pixel data to a predetermined range, selecting a function based on whether said value is within said predetermined range or outside said predetermined range, and calculating a linear attenuation coefficient from said pixel data using the selected function; and

output means for outputting said calculated linear attenuation coefficient.

45. The system as recited in claim 44, further comprising: storage means for storing conversion data.

46. The system as recited in claim 44, wherein said processing means calculates a transmission energy of said pixel data, and wherein

if said value is within said predetermined range, said processing means selects a function that is independent of said transmission energy related to said pixel data, and if said value is outside said predetermined range, said

processing means selects a function that is dependent upon said transmission energy.

47. The system recited in claim 44, wherein if said value is within said predetermined range, said processing means selects a function that includes an air-water approximation, and if said value is outside said predetermined range, said processing means selects a function that includes a water-bone approximation.

48. The system as recited in claim 44, wherein said processing means estimates an effective transmission energy associated with said pixel data.

49. The system as recited in claim 48, wherein said processing means converts said pixel data to Hounsfield units.

50. The system as recited in claim 48, wherein said predetermined range comprises a range of a Hounsfield units value for water to a Hounsfield units value for air.

51. The system as recited in claim 48, wherein said processing means generates a histogram for said CT image, determines a dominant bone peak from said histogram, and uses said dominant bone peak for estimating said effective transmission energy.

52. The system as recited in claim 51, wherein if said value is outside said predetermined range, said processing means selects a function based on said effective transmission energy and a value of said dominant bone peak.

53. The system as recited in claim 51, wherein if said value is inside said predetermined range, said processing means selects a function based upon a relationship between an emission energy related to said pixel and a transition energy.